

New Species of *Krombeinia* Pate and *Neotiphia* Malloch (Hymenoptera: Tiphidae)^{1, 2}

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ABSTRACT

Since the genera *Krombeinia* and *Neotiphia*, uncommon North American wasps of the family Tiphidae, were revised in 1964, the author has examined more than twice as many as were then available. Three new species of *Krombeinia* and two of *Neotiphia* have been identified and are described in this paper. They are *Krombeinia hurdi*, *K. oaxacae*, *K. sculleni*, *Neotiphia latirostrata*, and *N. aurisactae*.

The revision of the two genera of uncommon wasps, *Krombeinia* and *Neotiphia*, published in 1964 was based on a study of about 350 specimens. In this small number of specimens Allen and Krombein recognized 19 species of *Krombeinia*, of which 15 were new to science, and 19 species of *Neotiphia*, of which 9 were new to science, a total in the two genera of 38 species of which 24 were new to science. This has since been reduced by synonymy (Allen, 1965) to 35 species of which 22 were new to science.

Since the publication of the 1964 revision, the author has examined an additional 880 specimens, or more than twice as many as were available in 1964. Among these only 5 new species have been recognized, all from Mexico, of which 3 are *Krombeinia* and 2 *Neotiphia*. It would thus appear that future collecting will result in the discovery of relatively few new species. However, it should make it possible to recognize both sexes for numerous species now known in only one sex. All illustrations in this paper are by Mary H. Fuges.

This study was made possible by the loan of material from the following institutions:

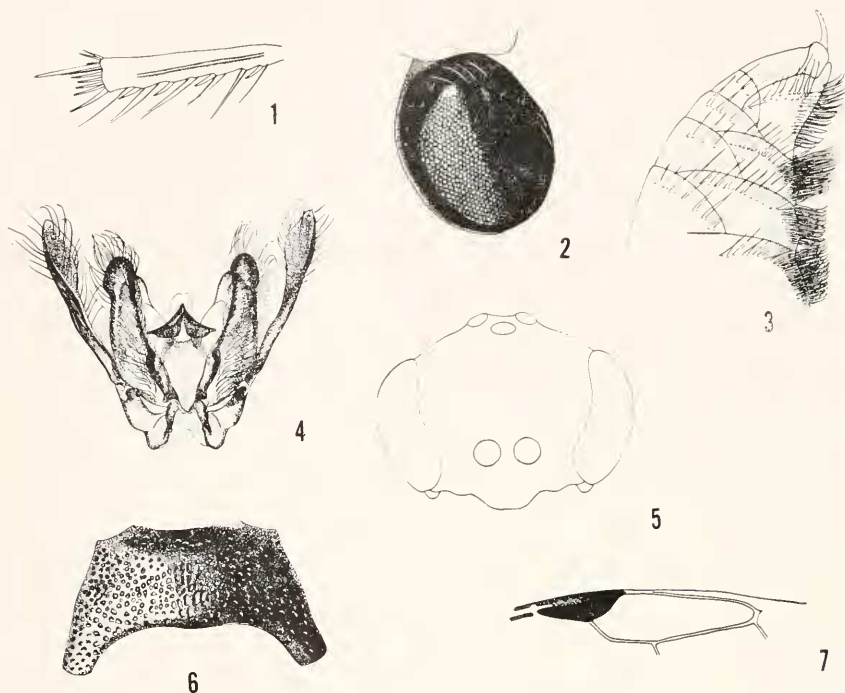
American Museum of Natural History [AMNH] through Dr. J. G. Rosen, Jr.; California Academy of Sciences [CAS] through Mr. Hugh B. Leech; Cornell University [CU] through Dr. L. L. Pechuman; Museum of Comparative Zoology [MCZ] through Dr. Howard E. Evans; Oregon State University [OreSU] through Dr. Paul W. Oman; University of California, Berkeley [UCB] through Dr. P. D. Hurd, Jr.; University of California, Davis [UCD] through Mr. A. T. McClay; University of California, Riverside [UCR] through Dr. Saul Frommer; University of Kansas [UK] through Dr. G. W. Byers; United States National Museum [USNM] through Dr. K. V. Krombein. Holotypes of *Krombeinia oaxacae*, *K. sculleni*, and *Neotiphia auri-*

¹ This is the tenth paper by the author (the first as co-author with K. V. Krombein) prepared under National Science Foundation Grants GB 1240 and GB-5171.

² Accepted for publication October 10, 1968.

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sactae (all new species) have been presented to the U. S. National Museum by the Entomology Department of Oregon State University.



FIGS. 1-4. *Krombeinia hurdi* n. sp., male, from 16 mi W of San Cristobal, Chiapas Mexico. 1, hind basitarsus. 2, left tegula. 3, abdomen showing tufts of hairs on sterna. 4, male genitalia. FIGS. 5-7. *Krombeinia oaxacae* n. sp., male, from 12 mi SE of Oaxaca, Mexico. 5, head outline. 6, dorsal pronotum. 7, section of forewing.

Krombeinia hurdi NEW SPECIES

(Figs. 1, 2, 3, 4)

Diagnosis.—Male. A large species with tegula only slightly longer than wide, which differs from other described species in possessing conspicuous erect tufts of fine hairs on sterna 3, 4, and 5, and fine carinae on inside of hind basitarsus.

Male.—Front with primary punctures of first-degree density to above level of lowest ocellus except band as wide as an ocellus, with scattered secondaries on lower half. Antennal flagellum slender, 1.8 times as long as wide (3 measured were 1.77, 1.82, 1.92), with all joints but first much longer than wide. Cheek slightly wider than an antennal fossa. Head width 1.7 times least distance between eyes (3 measured were 1.7, 1.7, 1.7). Mandible without preapical denticle.

Dorsal pronotum without transverse carina; chiefly shagreened, with closely contiguous primary punctures; impunctate apex very narrow, scarcely one-sixth as long as punctate part. Lateral pronotum with its disc flat and bearing about 10 short, parallel rugulae in ventral corner; without anterior process. Mesopleuron with primary punctures small, and over much of outer disc separated by distances greater than their average diameter; micropunctures everywhere much more numerous than primaries. Hind tibia on inner face with a large, sunken, clavate sensorial area. Hind basitarsus (Fig. 1) on inner face with a thin (sometimes 2 parallel) carinae extending almost entire length of joint. Tegula (Fig. 2) broadly shagreened, orbicular on outer margin, without marginal grooves, 1.1 times as long as middle width. Forewing with infumated membrane; radius 1 contiguous to costal margin for much more than half its length.

Dorsal propodeum outside areola faintly shagreened and finely aciculate, with a low, inconspicuous transverse carina. Areola only slightly tapered, with recurved sides; length about one and one-half times apical width. Tergum 1 with a well-developed transverse carina; punctures very numerous, rather uniformly distributed and not differing in size or distribution from those of tergum 2. Terga 2 to 6 with punctures numerous, of moderate size and fairly uniform in distribution without impunctate areas. Sternum 2 with a strong anterior transverse carina acutely pointed on median line. Sterna 3, 4, and 5 (Fig. 3) each with a median brush of dense, very long, fine, erect hairs. Sternum 6 not furcate apically, with a relatively narrow vitta slightly tapered toward apex, obscurely carinate, without bordering grooves; basally a low transverse carina which terminates laterally in a deep, longitudinally oriented incision. Genitalia (Fig. 4).

Length, 12 to 14.5 mm.

Female.—Unknown.

Holotype.—♂; 16 mi W of San Cristobal de las Casas, Chiapas, Mexico, 6-VII-57 (P. D. Hurd) [UCB].

Paratypes.—1; same data as holotype [UCB]. 1; 35 mi E of San Cristobal, Chiapas, Mexico, 26-VII-57 (J. A. Chemsak & B. J. Rannels) [UCB].

Discussion.—*Krombeinia hurdi* runs in the key (Allen & Krombein, 1964) to *tegularis* in couplet 8.

Krombeinia oaxacae NEW SPECIES

(Figs. 5, 6, 7)

Diagnosis.—Dorsal pronotum and tergum 1 without trace of transverse carina. Sternum 2 with a weak, anterior transverse carina. Sternum 6 with a median triangular carinate vitta terminating in a broad U-shaped transverse carina.

Male.—Front with closely contiguous punctures to above level of lowest ocellus except for a very small area below lowest ocellus; with secondary punctures on less than lower half; without median carina. Antennal flagellum 1.5 times as long as head width (2 measured were 1.55, 1.42). Head (Fig. 5) 2.0 times as wide as least distance between eyes (2 measured were 2.0, 2.0). Cheek slightly wider than an antennal fossa. Mandible with rudimentary preapical denticle.

Dorsal pronotum (Fig. 6) without transverse carina; punctate part with very fine, closely contiguous punctures except in a small medioapical area; impunctate apex scarcely one-eighth length of punctate part. Lateral pronotum puncto-rugulose above, finely rugulose on ventral half, without groove across disc; anterior process low but sharp-crested almost to ventral corner. Mesopleuron with coarse, shallow primary punctures of first-degree density on outer disc; minute secondaries everywhere much more numerous than primaries. Hind tibia with usual sunken clavate sensorial area which is continued basad of middle as a strong ridge terminating near base of joint. Tegula strongly shagreened; 1.35 times as long as middle width; outer margin broadly curved without marginal grooves. Forewing (Fig. 7) with radius 1 distinctly diverging from costal margin on more than half its length.

Dorsal propodeum polished rugulose at sides, near areola strongly reticulate over fine shagreening; transverse carina low, crooked. Areola with recurved sides, concave near apex, not enclosed apically, about one and one-half times as long as apical width. Posterior aspect of propodeum not concave; with median carina on lower two-thirds. Tergum 1 with anterior face normally declivous; with a small median patch of dense minute punctures; without trace of transverse carina; dorsum uniformly set with median-sized punctures except for a preapical band of smaller punctures about 3 punctures wide. Terga 3, 4, and 5 densely set with punctures of moderate and nearly uniform size; hairs of abdominal terga yellow. Sternum 2 with a faint, crooked transverse carina. Sternum 6 notched on side; apex not furcate; vitta at apex with median and lateral carinae, expanded basally into a slender triangle and ending at a broad, U-shaped transverse carina.

Length, 10 mm.

Female.—Unknown.

Holotype.—♂; 12 mi. SE of Oaxaca, Hidalgo, México, 22-VIII-63, 5,350 ft. (Scullen & Bolinger) [USNM].

Discussion.—Known only from holotype specimen. This species is exceptional in having no trace of dorsal pronotal carina or transverse carina on tergum 1. This species runs in Allen & Krombein's key to *robusta* in couplet 8.

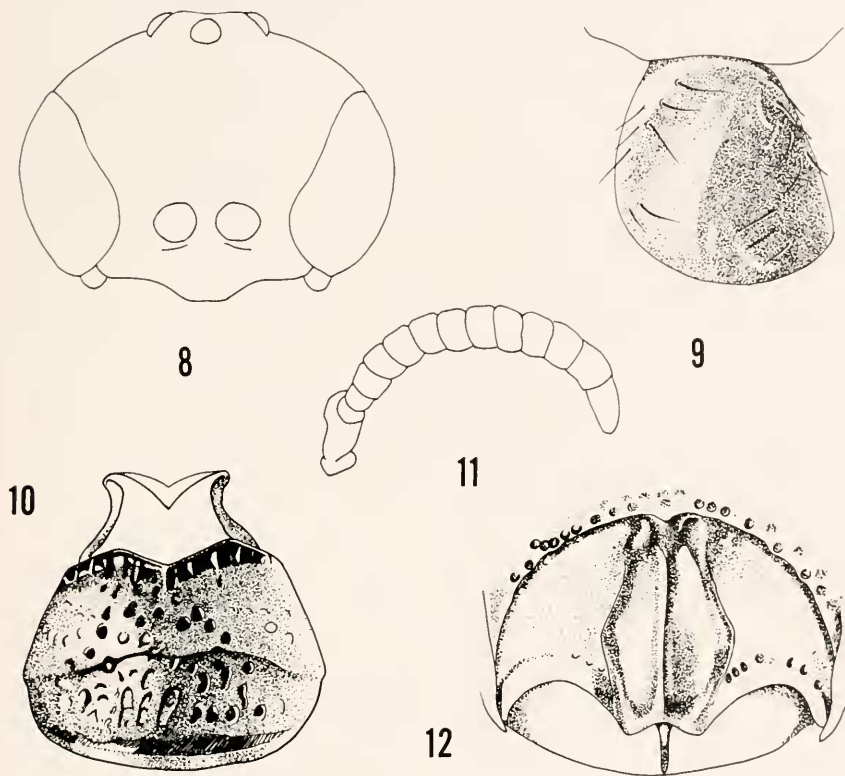
Krombeinia sculleni NEW SPECIES

(Figs. 8, 9, 10)

Diagnosis.—Male. A small, *Tiphia*-like species with two transverse carinae on tergum 1, the posterior one low, crooked, and bordering a broad preapical area of shallow and very irregular punctures of many sizes and shapes.

Male.—Front with punctures chiefly of first-degree density, thinning out at level of lowest ocellus; without secondary punctures. Antennal flagellum slender, all joints except first much longer than wide, 1.5 times as long as head width (4 measured were 1.52, 1.39, 1.56, 1.44). Head (Fig. 8) 2.2 times as wide as least distance between eyes. (5 measured were 2.2, 2.3, 2.2, 2.2, 2.1.) Cheek slightly narrower than an antennal fossa. Mandible without perapical denticle.

Dorsal pronotum with complete, sharp-crested transverse carina, densely punctate except for a narrow lateral and crescent-shaped median impunctate apex, with numerous secondaries laterally. Lateral pronotum usually with a series of obscure rugulae across disc; anterior process low, and rounded except at humeral angle. Mesopleuron with primary punctures on outer disc separated in all directions by much more than their average diameter; minute secondaries much more numerous



FIGS. 8-9. *Krombeinia sculleni* n. sp., male, from 5 mi SE of Oaxaca, Mexico. 8, head outline. 9, left tegula. FIG. 10. *K. sculleni* n. sp., male from Oaxaca, Mexico, tergum 1. FIGS. 11-12. *Neotiphia latirostrata* n. sp., male from 3 mi W of Pachuca, Hidalgo, Mexico. 11, antenna. 12, sternum 6 showing longitudinal and transverse carinae.

than primaries except on ventral aspect. Hind tibia with sensorial area relatively small, clavate, not sunken. Tegula (Fig. 9) orbicular on outside, 1.2 times as long as middle width. Forewing with radius 1 attaining costal margin one-half distance from apex of radial cell.

Dorsal propodeum with transverse carina very high; area beside areola without punctures. Areola rectangular, almost twice as long as wide, with median carina short and buttressing posterior transverse carina. Tergum (Fig. 10) with a high,

anterior, transverse carina buttressed by a regular series of short ridges; posterior dorsum on lower two-fifths with coarse, shallow punctures very irregular in size and shape and limited anteriorly by a crooked, transverse ridge. Intermediate terga with numerous, rather fine shallow punctures, more numerous anteriorly and in a row just cephalad of the broad impunctate apices. Pygidium with punctate part bordered by lateral groove and bordering carinae. Sternum 2 without anterior transverse carina. Sternum 6 with its lateral edge moderately notched; its apex broadly furcate; median vitta with low, bordering carinae; without basal transverse carina.

Length, 5.5 to 7 mm.

Female.—Unknown.

Holotype.—♂; Oaxaca, Oaxaca, Mexico, 5,068 ft, 24-VIII-57 (H. A. Scullen) [USNM].

Paratypes.—4: same data as holotype (one lacks a head and another an abdomen) [OreSU]. 3; 3 mi N of Huajuapán de León, Oaxaca, Mexico, 8-IX-59 (R. H. & E. M. Painter) [UK]. 1; 5 mi S of Oaxaca, Mexico, 6,150 ft, 21-VIII-63 (Scullen & Bolinger) [OreSU].

Discussion.—This species more closely resembles a *Tiphia* than any *Krombeinia* so far discovered. The polished apical bands of the terga are *Tiphia*-like. However, the male possesses the notched margin of sternum 6, a vitta of sternum 6 bordered by carinae, and a radial cell with radius 1 only gradually sloped from its apex to the costal margin, all distinctive *Krombeinia* characters. *K. sculleni* runs in key (Allen & Krombein, 1964) to couplet 6. In size, it is intermediate between *parva* of 5 mm or less and the species of large or moderate size.

Neotiphia latirostrata NEW SPECIES

(Figs. 11, 12)

Diagnosis.—Male. Flagellum of antenna short, about as long as width of head. Clypeus with a black, broad-tipped clypeal beak. Median depression of sternum 6 terminating basally at a long transverse carina which is not invaginated at middle.

Male.—Front with punctures of first-degree density except for an area below ocellar triangle and about as large where they are of second-degree density; without secondaries; with an obscure, narrow, median carina. Antennal flagellum (Fig. 11) short and stubby, 1.1 times as long as width of head (4 measured were 0.98, 1.09, 1.11, 1.05). Cheek much wider than an antennal fossa. Head width 1.65 times least diameter between eyes (4 measured were 1.68, 1.62, 1.65, 1.65). Clypeus produced in a conspicuous beak with its apex black, about as wide as an antennal fossa, its disc concave, its base much broader than antennal base line; lateral pit exceptionally enlarged, deep, as broad as mandible. Mandible without preapical cusp. Area bordering oral cavity with numerous small secondary punctures but without dense pubescence. Occipital carina without projections.

Dorsal pronotum with complete transverse carina; punctate part ranging from first- to third-degree density, without secondaries, about as long as impunctate part.

Lateral pronotum with scattered punctures on upper half, obscure rugulae in ventral corner; with a short inconspicuous groove on middle disc; anterior process low with rounded crest. Mesopleuron with coarse punctures everywhere of first-degree density, without interspersed secondaries; with abundant long fine hair. Hind tibia on inner face with usual sunken, clavate sensorial area on distal half. Hind basitarsus 5.5 times as long as middle width. Tegula broader than long with a groove about its apical margin. Forewing with its membrane moderately infuscated.

Dorsal propodeum with a high transverse carina; area beside areola obscurely coarse reticulate. Areola strongly tapered, length slightly greater than basal width and one and one-half times apical width. Tergum 1 with anterior aspect almost perpendicular to dorsum; transverse carina strong with numerous buttressing ridges; dorsum with many medium-sized punctures, on sides of first-degree density. Intermediate terga with medium-sized punctures of fairly uniform distribution; with white hairs. Tip of escutcheon of sternum 1 not spine-like. Sternum 2 without anterior transverse carina. Sternum 6 (Fig. 12) with median depression deep, with strong, narrow median keel, broadly flaired at middle, terminating at a long transverse carina which is not invaginated medially.

Length, 9 to 11.5 mm.

Female.—Unknown.

Holotype.—♂: 3 mi W of Pachuca, Hidalgo, Mexico, 24-VI-53, on pepper tree [UK].

Paratypes.—3; same data as holotype [UK].

Discussion.—*Neotiphia latirostrata* runs in key (Allen & Krombein, 1964) to *barbata* in couplet 4. It appears related to *rostrata* Allen and *barbata* Allen & Krombein. It differs from both in having a broader beak which is black at its tip. It lacks the coarse spines on the occipital carina of *rostrata*, and the abruptly invaginated transverse carina of the sixth sternum found in both *rostrata* and *barbata*.

Neotiphia aurisaetae, NEW SPECIES

Diagnosis.—Female. *Neotiphia aurisaetae* runs in key (Allen & Krombein, 1964) to *waltoni* in couplet 25, from which it differs in lacking a series of pits on lateral pronotum parallel to its posterior margin, in having golden hairs and bristles on dorsal pronotum and abdominal terga, and in having the elevated part of the pygidium acutely pointed and not obtusely rounded at apex.

Female.—Vertex without minute punctures. Front without interspaces wider than an ocellus; median carina very short but high enough to be visible in profile. Dorsum of pronotum with transverse carina weak but complete; punctures everywhere of first-degree density; bristly hairs golden. Side of pronotum with parallel rugulae on more than lower half; without a series of pits parallel to posterior margin. Hind tibia on inside with sensorial area a minute oval pit, its length much less than half width of micropunctate band. Tegula broader than long, posterior edge without a vertical face. Forewing with a flavous membrane. Abdominal terga with golden hairs and bristles, apical rows brilliantly golden. Pygidium with punctate part abruptly elevated on posterior border, its apex extended in an acute point.

Length, 11 mm.

Male.—Unknown.

Holotype.—♀: 15 mi S of Puebla, Puebla, Mexico, 5,200 ft, 6-IX-57 (H. A. Scullen) [USNM].

REFERENCES CITED

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- ALLEN, H. W. 1965. Tiphinae (Hymenoptera: Tiphidae) of western North America. *Proc. Acad. Nat. Sci. Philadelphia* 117: 45-115.

The Entomologist's Record

To encourage the publication of concise and useful new distribution records, corrections of previously published erroneous records, misidentifications, short field notes, and current news items about entomologists, amateur and professional, entomology departments and museums, prompt (monthly) publication is offered in this department.

The Garden Centiped at London, Ontario.—Two garden centipeds, *ScutigereUa immaculata*, were found in May, 1964, one on a hillside and the other in a greenhouse.

During the summer of 1964 a study of terrestrial non-insect arthropods was conducted in the vicinity of London, Ontario, based upon collections made at twenty-six localities. Eleven species of sowbugs were collected and a report on their distribution is given by Judd (1965, *Canadian Field-Naturalist*, 79(3): 197-202). Twenty species of millipeds were found and are reported on by Judd (1967, loc. cit., 81(3): 189-196). Both these reports include a map showing the twenty-six localities, A to Z, at which the collections were made. The sowbugs and millipeds were found by removing bark from logs and stumps and by turning over logs, boards, stones, piles of trash and other objects on the ground. In and around greenhouses a search was made beneath pots, potting benches and seed flats. Two symphylans were found, one on May 13 beneath sticks on a hillside at locality C which is "The Coves," a plain surrounded by a backwater of the Thames River, and the other on May 25 beneath a stick inside a greenhouse, locality K, on Riverside Drive. They were both identified as the garden centiped, *ScutigereUa immaculata* (Newport) by Dr. C. E. Williams, Wabash College, Crawfordsville, Indiana. The specimen collected on May 13 is in the collection of Dr. Williams and that collected on May 25 is mounted on a slide numbered E32.4 in the collection of the Department of Zoology, University of Western Ontario. The finding of only two specimens of *S. immaculata* among the many specimens of sowbugs and millipeds indicates that this species is comparatively rare in the London area. Waterhouse (1967, *Canadian Ent.*, 99(7): 696-702) shows that this species can produce large populations when it infests root crops. Michelbacher (1938, *Hilgardia* 11(3): 55-148) records that it occurs on all continents but Australia and that it may be present from the surface to as deep as four feet down into the soil and may build up large populations in farming country, doing much damage to crops.—WILLIAM W. JUDD, *Department of Zoology, University of Western Ontario, London, Ontario, Canada.*